MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE. Assistant Editor: FRANK OWEN STETSON.

VOL. XXXIV. AUGUST, 1906. No. 8

The MONTHLY WEATHER REVIEW is based on data from about 3500 land stations and many ocean reports from vessels taking the international simultaneous observation at Greenwich noon.

Special acknowledgment is made of the data furnished by the kindness of cooperative observers, and by Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt I. S. Kimball, General Superintendent of the United States Life-Saving Service; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Secretary, Meteorological Office, London; H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Anastasio Alfaro, Director of the National Observatory, San José, Costa Rica; Rev. L. Gangoiti, Director of the Meteorological Observatory of Belen College, Havana, Cuba.

As far as practicable the time of the seventy-fifth meridian, which is exactly five hours behind Greenwich time, is used in the text of the MONTHLY WEATHER REVIEW.

Barometric pressures, both at land stations and on ocean vessels, whether station pressures or sea-level pressures, are reduced, or assumed to be reduced, to standard gravity, as well as corrected for all instrumental peculiarities, so that they express pressure in the standard international system of measures, namely, by the height of an equivalent column of mercury at 32° Fahrenheit, under the standard force, i. e., apparent gravity at sea level and latitude 45°.

SPECIAL ARTICLES, NOTES, AND EXTRACTS.

THE INTERNATIONAL SYMBOLS.

By Mr. HENRY HELM CLAYTON. Dated Blue Hill Observatory, Hyde Park, Mass., May 8, 1906.

In the excellent article by Mr. Miller, in the December, 1905, WEATHER REVIEW, Vol. XXXIII, page 524, on the international definitions and symbols, he uses the expression "Silver thaw" as an equivalent of the symbol ∨. The expression "Silver thaw" is a meteorological term used in England, but not in the United States, and I did not know its exact meaning until I had occasion to look it up recently. In the English edition of the report of the Vienna Congress, where the symbols originated in 1874, the expression "Silver thaw" is given as the equivalent of the German "Rauhfrost", indicated by the symbol ∨. "Glazed frost" is given as the equivalent of the German "Glatteis" and indicated by the symbol ∞. Mr. R. H. Scott, in his "Elementary Meteorology", p. 115, 1887, gives "Silver thaw" and "Glazed frost" as equivalent expressions, and defines them as follows:

> The frozen surface which is occasionally produced at the beginning of a thaw, if a warm wind suddenly sets in. The damp air, passing over the ground, of which the temperature is exceedingly low, has its moisture deposited in the solid form, and all objects on which this deposit takes place are covered with a sheet of ice. This phenomenon is intensified if a fall of rain occurs at the time.

Wind blowing against cold objects does not produce a "sheet of ice"; this is brought about by the second method suggested by Mr. Scott, namely, the falling of raindrops against objects cooled below the freezing point. Mr. William Marriott in his "Hints to Meteorological Observers", 1902, is more specific and defines "Silver thaw", on page 59, as "Rain falling when the air is below the freezing point and congealing when it falls". I find also that Mossman and other English writers use "Silver thaw" in this sense. It is evident from the above that "Silver thaw" is not the equivalent of the German "Rauhfrost". Doctor Hann defines "Rauhfrost" as "a rich, frost-like, rough deposit of ice particles which forms over the irregularities of the earth's surface, on edges, corners, and on the branches and twigs of trees. It is distinguished from frost by the conditions of its formation. Ordinary frost forms on clear nights like the dew, but "Rauhfrost", however, in foggy weather; the latter is formed from the fine fluid fog particles which are cooled below the freezing point, and therefore turn to ice by contact with solid bodies.

It seems evident, from these quotations, that the American term "Frostwork" is equivalent to the German "Rauhfrost", but that the English term "Silver thaw" is equivalent to the American term "Ice storm" and should be defined by the symbol ∞. I write this to prevent, if possible, the expression "Silver thaw" coming into use as the equivalent of the terms "Frostwork", "Rauhfrost", and "Givre", and thus causing confusion in terminology and description.

THE METEOROLOGICAL OPTICS OF PROF. J. M. PERNTER.

By Prof. R. W. WOOD. Dated Johns Hopkins University, Baltimore, Md., September 15, 1906.

The subjects treated in this volume[1] comprise the various types of halos, parhelia, rainbows, etc.; in fact the entire list of phenomena due to the reflection, refraction, and diffraction of light by clouds, snow crystals, and raindrops suspended in the air. It is doubtful if any type of halo with its accompanying parhelia, and there is a large number of them, has ever been observed which is not explained in this very comprehensive treatise.

The value of Doctor Pernter's book is somewhat marred, in the writer's opinion, by a very peculiar mistake which the author, in common with some other writers on this subject, makes almost at the outset. As is well known, a large number of these optical phenomena can only be explained by assuming an orientation of the ice crystals or spiculæ floating in the air. These may roughly be divided into two types, elongated hexagonal prisms or spiculæ, fig. 2, and flattened hexagonal laminæ, fig. 1, the form usually observed in the case of snowflakes. The author states, on page 318, that a body falling through a resisting medium (the air) orients itself in such a way that the resistance offered by the medium is a *minimum*, i. e., the long spiculæ stand vertically, while the flat plates take a position such that the diagonal of the hexagon points up and down, in other words, stand on end; whereas the true positions are perpendicular to these and are shown in figs. 1 and 2. It seems odd that such a mistake could have been made, since we have so many examples of the principle that a falling body takes the position of *maximum* resistance, mica flakes settling in water, falling leaves and pine needles, an unfeathered arrow, etc. It is evidently not a slip of

[1] Meteorologische Optik von J. M. Pernter. Theil III. Wilhelm Braumueller. Wien und Leipzig.